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10/019,615	05/28/2002	Ravi Chandran	12785US01	7963

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EXAMINER
WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/019,615	CHANDRAN ET AL.
Office Action Summary	Examiner	Art Unit	
	James S. Wozniak	2626	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 May 2002*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-61* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   **Claims 26 and 27** are objected to because of the following informalities:

Claim 27 appears to be part of the claimed apparatus for reducing echo recited in claim

26, which is similar to the method recited claim 58. Therefore, "27." on line 7 of claim 26

should be deleted and claim 27 should be canceled. Claims 26 and 27 will be considered to be a

single claim for the following rejections.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

3.   **Claims 1-31 and 57-61** are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the enablement requirement. The claim(s) contains subject matter that was not

described in the specification in such a way as to enable one skilled in the art to which it pertains,

or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 26 both recite "a processor responsive to..." but lack means for performing

the operations that the processor performs.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

Claim 57 recites a single step method for a single means claim, and thus, is also rejected under 35 U.S.C. 112, first paragraph for the above noted reasons.

Dependent claims 2-25, 27-31 and 58-61 do not remedy the lack of enablement issue noted above with respect to claims 1, 26, and 57, and therefore, are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5.   **Claims 57-61** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per the MPEP (2106 [R-3], IV):

> In practical terms, claims define nonstatutory processes if they:
> -- consist solely of mathematical operations without some claimed practical application
> (i.e., executing a "mathematical algorithm"); or
> -- simply manipulate abstract ideas, e.g., a bid (*Schrader*, 22 F.3d at 293-94, 30
> USPQ2d at 1458-59) or a bubble hierarchy (*Warmerdam*, 33 F.3d at 1360, 31
> USPQ2d at 1759), without some claimed practical application.

In the particular case of Claim 57, the claimed subject matter is directed towards a

method comprising "adjusting first bits and second bits," which is merely a manipulation of

abstract data in a processing device that does not, in itself, produce a useful, concrete, and

tangible result.

Dependent claims 58-61 do not remedy the non-statutory subject matter issue noted

above with respect to claim 57, and therefore, are also rejected under 35 U.S.C. 101, as being

directed towards non-statutory subject matter.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

7.   **Claims 1-4, 7, 12, 15-16, 18-19, 21-22, 26-27, 32-35, 38, 43, 47, 50, 52-53, and 57** are

rejected under 35 U.S.C. 102(e) as being anticipated by Rabipour et al *(U.S. Patent: 6,011,846)*.

With respect to **Claims 1 and 32**, Rabipour discloses:

A processor responsive to the near end digital signal to read at least said first parameter of said plurality of parameters, to perform at least one of said plurality of decoding steps on the near end digital signal and the far end digital signal to generate at least partially decoded near end signals and at least partially decoded far end signals *(extracting speech parameters from near and far end encoded speech signals, Col. 3, Line 48- Col. 4, Line 22)*; and

Responsive to said at least partially decoded near end signals and at least partially decoded far end signals to adjust the first parameter to generate an adjusted first parameter and to replace said first parameter with the adjusted first parameter in the near end digital signal *(adjusting near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16)*.

With respect to **Claims 2 and 33**, Rabipour discloses:

The first parameter is a quantized first parameter and wherein said processor generates said adjusted first parameter in part by quantizing said adjusted first parameter before writing said adjusted first parameter into said near end digital signal *(replacing speech parameters with adjusted speech parameters after quantization, Col. 6, Line 40- Col. 7, Line 32)*.

With respect to **Claims 3 and 34**, Rabipour discloses:

The processor is responsive to the at least partially decoded near end signals and the at least partially decoded far end signals to generate an echo likelihood signal representing the amount of echo present in the partially decoded near end signals, and wherein the processor is responsive to the echo likelihood signal to adjust the first parameter *(Echo compensation adaptive to an echo presence certainty, Col. 5, Line 35- Col. 6, Line 16)*.

With respect to **Claims 4 and 35**, Rabipour recites:

Characteristics comprise spectral shape *(near and far end spectrum, Col. 3, Line 48- Col.*

4, Line 22) and wherein said first parameter comprises a representation of filter coefficients

(LPC coefficients including excitation parameters, Col. 6, Lines 20-31), and wherein said

processor is responsive to said echo likelihood signal to adjust said representation of filter

coefficients towards a magnitude frequency response *(modifying LPC coefficients based on a*

modified impulse response, Col. 6, Line 20- Col. 7, Line 32).

With respect to **Claims 7 and 38**, Rabipour recites:

The magnitude frequency response corresponds to background noise *(correction factor*

determined using an impulse response for updated LPC parameters corresponding to

background noise, Col. 7, Lines 11-62).

Claims 12 and 43 contains subject matter similar to Claims 4 and 35, and thus, is

rejected for similar reasons.

With respect to **Claim 15**, Rabipour discloses LPC coefficients including excitation

parameters *(Col. 6, Lines 20-31)*.

With respect to **Claims 16 and 47**, Rabipour discloses partial decoding for extracting

speech parameters, which avoids synthesis processing *(Col. 1, Line 52- Col. 3, Line 10)*.

With respect to **Claim 18**, Rabipour discloses:

The at least one decoding step comprises post filtering *(synthesis processing of a coded*

speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10).

With respect to **Claims 19 and 50**, Rabipour discloses the use of LPC-based speech

compression *(Col. 1, Lines 48-51)*.

With respect to **Claims 21 and 52**, Rabipour discloses the use of CELP compression *(Col. 8, Lines 8-11)*.

With respect to **Claims 22 and 53**, Rabipour discloses averaging a set of near and far end LPC parameters to determine a degree of echo compensation *(Col. 3, Line 48- Col. 4, Line 22)*.

With respect to **Claims 26-27 and 57**, Rabipour discloses:

A processor responsive to the near end digital signal and the far end digital signal to adjust the first and second bits *(LPC compressed speech data bit stream adjusted based on near and far end speech data, Col. 3, Lines 1-10; Col. 3, Line 48- Col. 4, Line 22; Col. 5, Line 35- Col. 7, Line 32)*.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9.   **Claims 5-6, 13-14, and 36-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Strawczynski et al *(U.S. Patent: 6,138,022)*.

With respect to **Claims 5, 14, and 36**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour does not teach the use of line spectral frequencies *(LSFs)*, however Strawczynski teaches the use of such LSF coefficients *(Col. 3, Lines 24-34)*.

Rabipour and Strawczynski are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the LSF coefficients taught by Strawczynski in order to provide speech coefficients that uniquely define a human articulatory tract, which are suited to a number of different applications *(Strawczynski, Col. 3, Lines 24-34)*.

With respect to **Claims 6, 13, and 37**, Strawczynski additionally recites the use of log area ratio coefficients *(Col. 3, Lines 24-34)*.

10.   **Claims 8-9 and 39-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Gritton et al *(U.S. Patent: 5,857,167)*.

With respect to **Claims 8 and 39**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour also discloses LPC coefficients related to an energy level (Col. 5, Line 45- Col. 6, Line 16). Rabipour does not specifically suggest the use of a codebook gain, however Gritton teaches the use of such a gain parameter *(Col. 6, Lines 55-65)*.

Rabipour and Gritton are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the gain codebook parameters taught by Gritton in order to provide a means for compensating for an error between original and synthesized speech *(Col. 4, Lines 31-67)*.

With respect to **Claims 9 and 40**, Gritton teaches the codebook gain as applied to Claim 8.

11.   **Claims 10-11, 20, 23-25, 41, 42, 46, 49, 51, and 54-56** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen (U.S. Patent: 5,651,091).

With respect to **Claims 10 and 41**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour does not specifically suggest the use of long-term predictor and pitch period parameters, however Chen discloses the use of such parameters *(Col. 4, Lines 3-44)*.

Rabipour and Chen are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the long-term predictor and pitch period parameters taught by Chen in order to provide parameters that exploit the pitch periodicity in voiced speech *(Chen, Col. 4, Lines 29-31)* and impose lesser demands upon echo suppressors *(Chen, Col. 1, Lines 38-48)*.

With respect to **Claims 11 and 42**, Chen further recites the use of a long-term pitch predictor and an associated pitch gain *(Col. 3, Lines 14-25)*.

With respect to **Claims 20 and 51**, Chen discloses the long-term predictor coding as applied to Claim 11.

With respect to **Claims 23 and 54**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing *(Col. 5, Lines 5-8)*.

With respect to **Claims 24 and 55**, Rabipour teaches completing echo suppression for a frame before advancing to a next frame as shown in Figs. 2C and 3, while Chen discloses the subframe based processing as applied to Claim 23.

With respect to **Claims 25 and 56**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters for each speech frame according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing *(Col. 5, Lines 5-8)*.

With respect to **Claim 46**, Rabipour further discloses LPC coefficients including excitation parameters *(Col. 6, Lines 20-31)*.

With respect to **Claim 49**, Rabipour further discloses:

The at least one decoding step comprises post filtering *(synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10)*.

12.   **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Christensson et al *(U.S. Patent: 6,510,224)*.

With respect to **Claim 17**, Rabipour discloses the echo suppression system and method utilizing spectrum coefficients, as applied to Claims 1 and 12. Rabipour does not specifically suggest the use of power parameters, however Christensson teaches the use of such parameters *(Col. 6, Line 40- Col. 7, Line 8)*.

Rabipour and Christensson are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the use of power parameters in echo suppression as taught by Christensson in order to achieve

improved echo suppression performance based on a power parameter and focused on frequency

bands where an echo component could easily be mistaken for near end speech *(Christensson,*

Col. 7, Lines 1-8).

13.   **Claims 28-31 and 58-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Rabipour et al in view of Navaro et al *(U.S. Patent: 6,108,560).*

With respect to **Claims 28 and 58**, Rabipour discloses the system for adapting speech

parameters as applied to Claim 26. Rabipour does not teach the use of the PCM coding standard,

however Navaro discloses the use of such a standard in a TFO GSM environment *(Col. 6, Lines*

11-29).

Rabipour and Navaro are analogous art because they are from a similar field of endeavor

in speech coding systems. Thus, it would have been obvious to a person of ordinary skill in the

art, at the time of invention, to modify the teachings of Rabipour with the PCM coding

implementation in a GSM system as taught by Navaro in order to achieve high quality speech

coding in a mobile environment *(Navaro, Col. 1, Line 11- Col. 2, Line 11).*

With respect to **Claims 29 and 59**, Navaro further teaches speech coding implemented in

such an environment *(Col. 6, Lines 11-29).*

With respect to **Claims 30-31 and 60-61**, Rabipour teaches adjusting speech parameters

as applied to Claim 26, while Navaro further recites the TFO frame format comprising 2 LSBs

and 6 MSBs of PCM speech data *(Col. 6, Lines 11-29).*

14.   **Claims 44-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et

al in view of Chen, and further in view of Strawczynski et al.

With respect to **Claim 44**, Rabipour in view of Chen discloses the echo suppression

system and method utilizing speech coefficients comprising a long-term pitch predictor and an

associated pitch gain, as applied to Claim 42. Rabipour in view of Chen does not teach the use

of log area ratios *(LARs)*, however Strawczynski teaches the use of such LAR coefficients *(Col.*

3, Lines 24-34).

Rabipour, Chen, and Strawczynski are analogous art because they are from a similar field

of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in

the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the

LAR coefficients taught by Strawczynski in order to provide speech coefficients that uniquely

define a human articulatory tract, which are suited to a number of different applications

(Strawczynski, Col. 3, Lines 24-34).

With respect to **Claim 45**, Strawczynski teaches the use of such LSF coefficients *(Col. 3,*

Lines 24-34).

15.   **Claim 48** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in

view of Chen, and further in view of Christensson et al.

With respect to **Claim 48**, Rabipour in view of Chen discloses the echo suppression

system and method utilizing LPC coefficients, as applied to Claim 46. Rabipour in view of Chen

does not specifically suggest the use of power parameters, however Christensson teaches the use

of such parameters *(Col. 6, Line 40- Col. 7, Line 8)*.

Rabipour, Chen, and Christensson are analogous art because they are from a similar field

of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in

the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the

use of power parameters in echo suppression as taught by Christensson in order to achieve

improved echo suppression performance based on a power parameter and focused on frequency

bands where an echo component could easily be mistaken for near end speech *(Christensson,*

Col. 7, Lines 1-8).

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

Yajima et al *(U.S. Patent: 5,873,058)*- teaches gain adjustment of a speech signal at a

relay that performs partial decoding.

Ho et al *(U.S. Patent: 5,943,645)*- teaches an echo suppressor utilizing partial decoding.

Malvar *(U.S. Patent: 6,029,126)*- teaches the use of an echo suppressor in a speech

codec and coded domain processing.

Bertness et al *(U.S. Patent: 6,044,108)*- teaches a method for removing a far-end echo

from a near-end speech signal.

Kwan *(U.S. Patent: 6,504,838)*- teaches echo suppression processing for compressed

speech.

17.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Hudspeth can be reached at (571) 272-7843. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
5/18/2006

DAVID HUDSPETH
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